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Motion RC Supplemental Guide for the

Detrum GAVIN-8C Transmitter

Version 1.0

Contents

This guide provides instructions to help you program the Detrum GAVIN-8C for an airplane. Additional information can be found in the manual included with the radio.

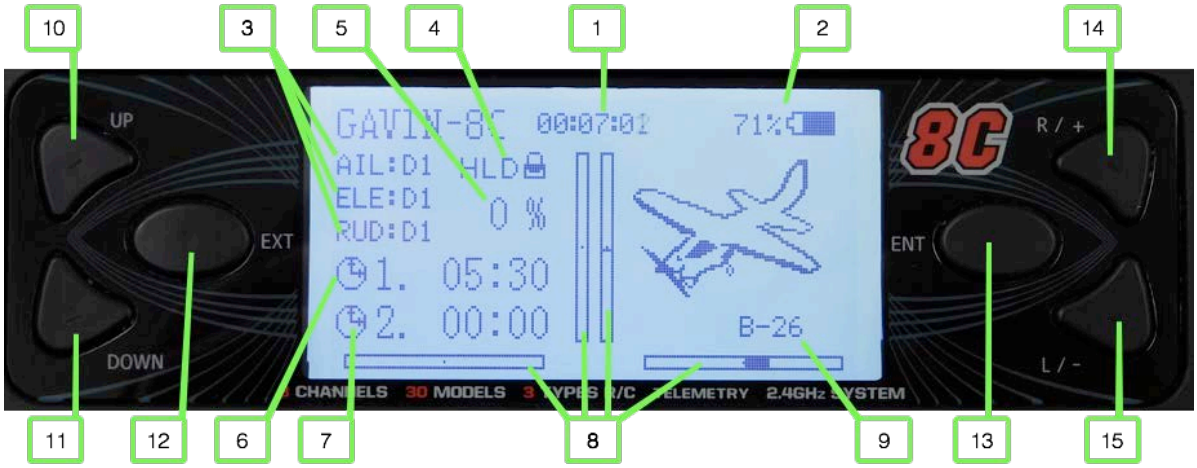
Review the Transmitter's Controls

1. Power switch—push the switch up to turn the transmitter on.
2. Status light—illuminated when the transmitter is turned on; flashes when in range test mode.
3. Trim buttons—push to set the trim for the associated channel.
4. Control sticks—control the channel to which they are connected.
5. SA, SB, SD, SE switches—three-position switches that can be used for a variety of functions.
6. SC switch—a two-position switch that is spring-loaded; when held against the spring, the transmitter passes control to another transmitter to which it is connected. You also use

this switch to bind the transmitter to a receiver.

7. SF switch—a two-position switch that is usually used for retracts.
8. Display screen—displays different pages of information while you are controlling a model or programming the transmitter. After a time of inactivity, the screen dims. Press a button to return the screen to full brightness.

Review the Home Screen



1. System timer—how long the transmitter has been turned on.
2. Battery status—how much charge remains in the batteries by percentage and icon.
3. AIL, ELE, and RUD Dual rate status—These indicators show the dual rate setting currently applied to each of these channels.
4. Hold indicator—when HLD is displayed, throttle hold is on and the motor won't spin when throttle is applied; when NORM is displayed, the throttle is active.
5. Percent of throttle—indicates how much throttle is being applied.
6. Timer 1—displays a countdown or count up timer, typically triggered by throttle or HOLD switch position. When the timer expires, you hear a tone and the timer flashes.
7. Timer 2—provides a second timer with the same capabilities as timer 1.
8. Trim indicators—the shaded part of the trim indicator indicates how much trim is applied to the associated channel and in which direction. When you are setting trim, the numerical value is displayed at the end of the trim indicator.
9. Active model—you see the name of the active model, which means the model that can be flown or programmed.

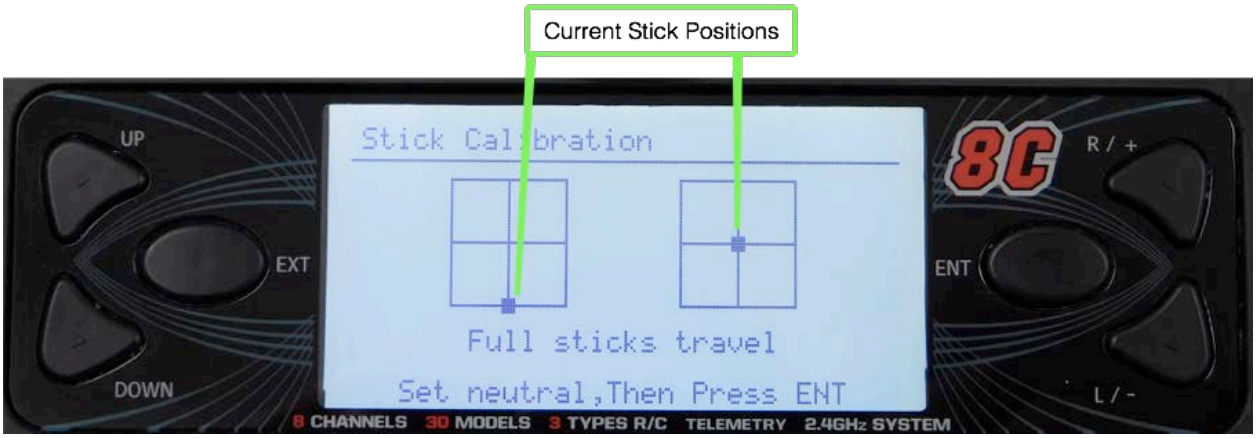
10. UP button—use this to highlight options on the screen when you program the transmitter.
11. DOWN button—use this to highlight options on the screen.
12. EXT button—press this to move back to the previous screen.
13. ENT button—press this to select a highlighted menu option. You also use it to enter range test mode.
14. R/+ button—press to increase values when you are programming the transmitter (hold down to rapidly scroll through options).
15. L/- button—press to decrease values when you are programming the transmitter.

Power the Transmitter

1. Remove the battery cover from the back of the transmitter.
2. Install 4 AA batteries per the diagram in the battery well.
3. Replace the battery cover.
4. Push the power switch on (up). The transmitter turns on, the home screen appears, and you are ready to calibrate the transmitter.

Calibrate the Transmitter

1. When the home screen is displayed, press the **ENT** button.
2. Use the **UP** or **DOWN** buttons to highlight *System Set*.
3. Press the **ENT** button.
4. Use the **UP** or **DOWN** buttons to highlight *Calibration* and press the **ENT** button.



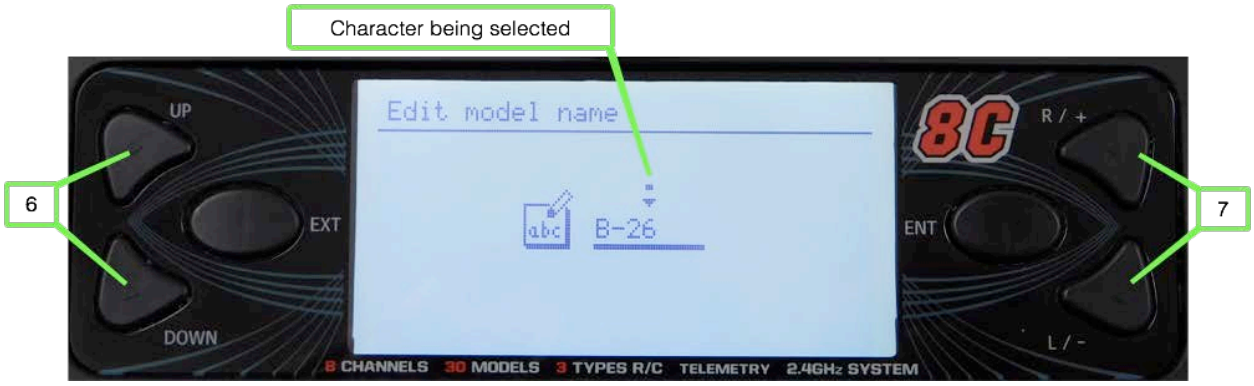
5. Move both sticks through their full range of motion top to bottom and side to side (you

can move them at the same time or individually). You see a representation of the stick motion and positions on the screen as you move the sticks.

6. Place both sticks in their neutral positions.
7. Press the ENT button. If successful, you see the "Completed!" message on the screen. If not, repeat these steps until it is calibrated successfully.

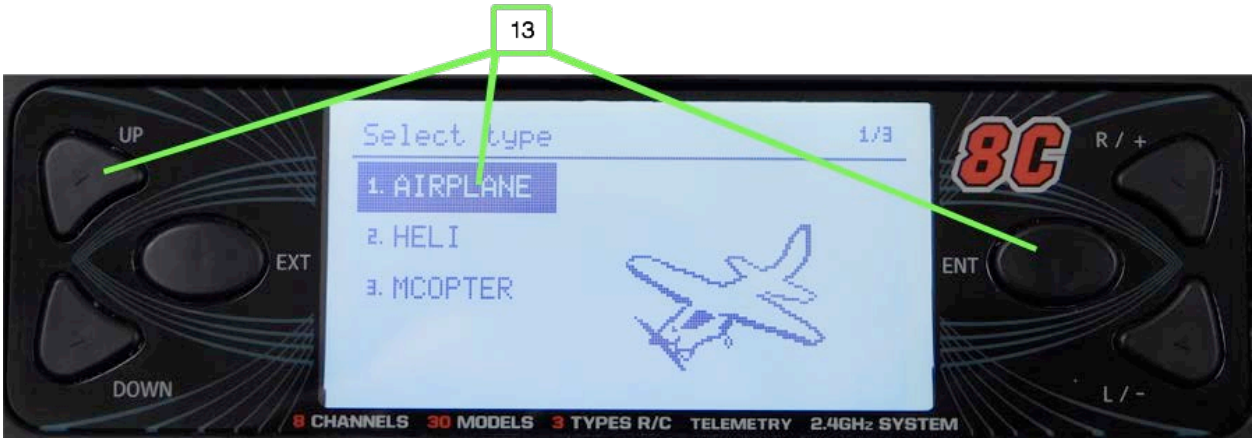
Create a Model

1. From the home screen, press **ENT**.
2. Use the **UP** or **DOWN** buttons to highlight *Model Set* and press the **ENT** button.
3. Use the **UP** or **DOWN** buttons to highlight *Model* and press the **ENT** button.
4. Highlight the position of the model you want to create, such as *MODEL02* and press the **ENT** button.
5. Highlight *Name* and press the **ENT** button.



6. Press the **Up** and **DOWN** buttons to select the character of the existing name you want to change; the current position is marked with a square.
7. Press the **R/+** and **L/-** buttons to choose the character you want in the current position. You can choose from UPPERCASE letters, lowercase letters, numbers, or special characters. Hold the **R/+** or **L/-** buttons down to rapidly scroll through the available characters.
8. Press the **Up** or **DOWN** button to select the next position.
9. Press the **R/+** and **L/-** buttons to choose the character you want in the current position.
10. Repeat steps 8 and 9 to complete the model name. You can choose the space character to "erase" an existing character.
11. Press **ENT** to save the new name.

12. Highlight *Type* and press **ENT**.



13. Use the **Up** or **DOWN** buttons to highlight the kind of model you are creating, such as *AIRPLANE*, and press **ENT**. (This guide shows an airplane model, you can configure other types using similar steps.)

14. Press **EXT** twice to return to the home screen. You should see the name of the model you created on the screen, indicating it is the active model.

Bind a Receiver to a Model

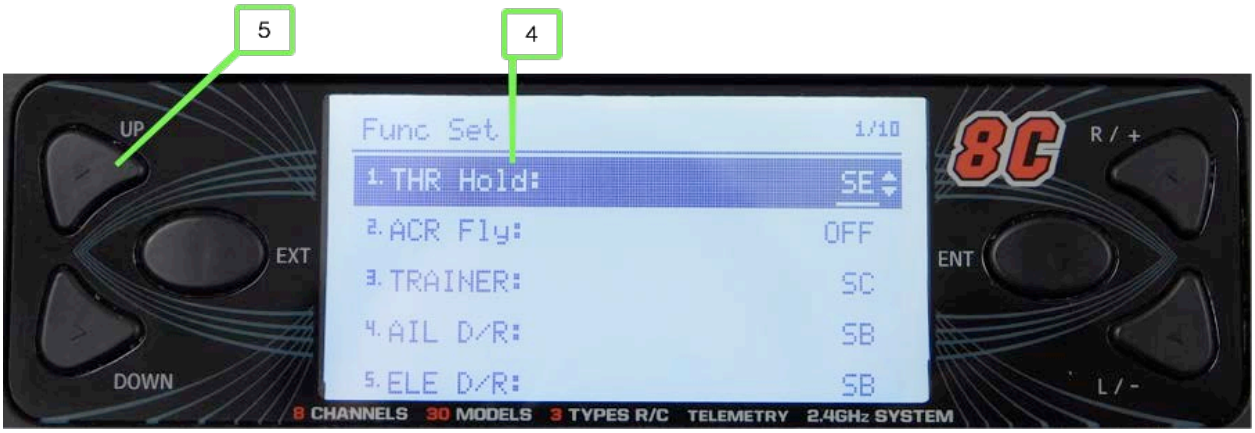
1. When the home screen is displayed, press **ENT**.
2. Select *Model Set* and press **ENT**.
3. Select *Model* and press **ENT**.
4. Highlight the model you want to bind to the receiver and press **ENT**. The model you selected becomes active.

5. Press **EXT** twice to move back to the home screen.
6. Turn the transmitter off.
7. Connect the receiver to at least one servo and to the ESC.
8. If you are using a receiver that has a BIND port, follow steps 9 and 10; if you are using a receiver with a Bind button, follow steps 11 and 12 instead.
9. Insert the Bind plug into the BIND port.
10. Power the receiver by connecting a battery to the ESC. The Bind light on the receiver flashes indicating that it is in Bind mode. Skip to step 13.
11. Power the receiver by connecting a battery to the ESC. The Bind light flashes rapidly.
12. Hold the Bind button down until the Bind light flashes more slowly.
13. Hold the SC switch in the forward position (toward the front of the transmitter) and turn the transmitter on. You hear the bind tone on the transmitter and the Bind light on the receiver becomes solid, indicating the bind process is complete.
14. Move the control associated with the servo you connected to ensure it moves. If so, the model is bound. If not, repeat this process until it is successful.
15. Power off the receiver and remove the Bind plug (if applicable).
16. Power off the transmitter.

Configure a Throttle Hold Switch

You should have a throttle hold switch on the transmitter that disables the throttle to minimize the chances of an accident due to a prop or EDF spinning unintentionally.

1. Turn the transmitter on and use steps 1-5 in the previous task to select the model you want to program. Confirm that the model you want to program is shown on the home screen.
2. Press **ENT**.
3. Select *Func Set* and press **ENT**.



4. Select *THR Hold*.
5. Use the **Up** or **DOWN** buttons to select the switch you want to use for the throttle hold switch. If the plane you are programming doesn't have retracts, put the throttle hold on the SF switch because it is a two-position switch. If the model does have retracts, you should use one of the other switches.
6. Press **EXT** twice to return to the home screen.

Prepare to Program an Airplane

1. Connect the ESC to the THRO channel on the receiver.
2. Connect the aileron, elevator, and rudder servos to their respective ports on the receiver.
3. Connect the retracts to the GEAR port.
4. Connect the flap servos to the AUX1 port.

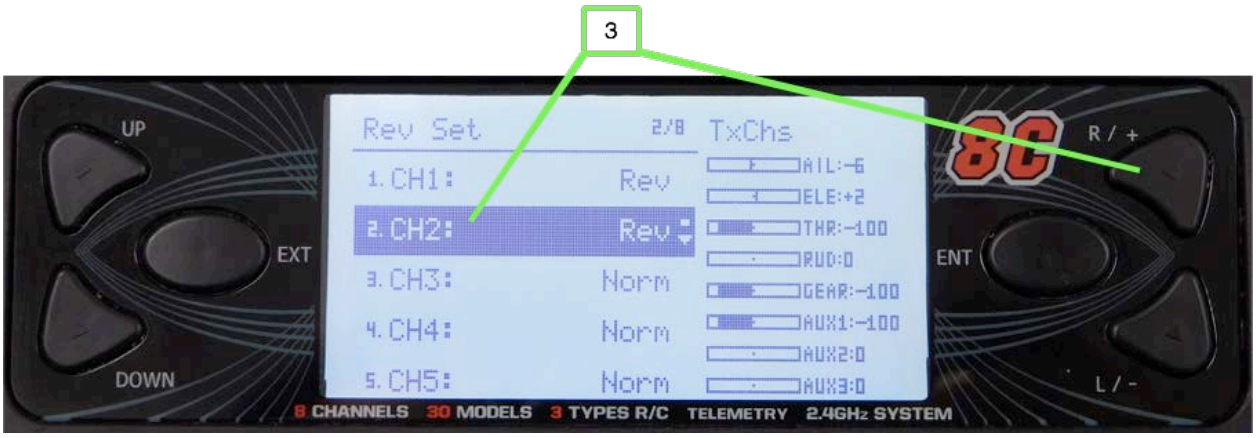
5. Turn the transmitter on and use steps 1-5 in the "Bind a Receiver to a Model" task to

select the model you want to program. Confirm that the model you want to program is shown and has been bound to the receiver.

6. Check to ensure HLD appears on the home screen, indicating the throttle hold is active; if you don't see HLD, move the throttle switch that you set in step 5 of the previous task to the opposite position; if you are using switch **SF**, this requires one click while if you selected one of the three-position switches, you need to move the switch through two clicks. HLD should appear on the home screen, which means the throttle is inactive and programming the model is safer because you won't get unintended prop or EDF spinning. If HLD doesn't appear, perform the steps in the previous task to ensure you have configured a throttle hold switch.
7. Connect a battery to the ESC. You should hear the startup tones from the ESC and see a solid light on the receiver.
8. Ensure that a spinning prop or EDF is not a safety hazard, set the throttle switch to the off position (NORM appears on the home screen indicating the throttle is in normal operation mode), and slowly advance the throttle to ensure the motor spins.
9. Return the throttle hold switch to the on position so the motor no longer spins; you see HLD on the home screen.
10. Systematically check each control surface for movement including rudder, ailerons, elevator, flaps, and retracts. You can change direction and amount of movement later, now you are ensuring the transmitter can activate the controls correctly.
11. After you've confirmed all the model's controls are working, you are ready to do the detailed programming of the model.

Program Servo Direction

1. Set the correct direction for each servo using the Rev Set function; to access this from the home screen, press **ENT**, select *Model Parameter*, press **ENT**, select *Rev Set*, and press **ENT**. You move to the Rev Set screen where you see the current servo direction (Norm or Rev) for each channel. You also see a visual representation of the channel's position and direction of motion on the right side of the screen. The numbers on the far right are the current trim setting for the channels.
2. Check the direction of motion for a control surface, such as the elevator. If the direction needs to be reversed, perform step 3; if not, skip to step 4.



3. Select the channel for the control surface (such as *CH2* for the elevator), and press the **R**/+ button. The direction setting changes from Norm to Rev and the servo moves in the opposite direction.
4. Check the direction of motion for another control surface, such as the ailerons.
5. If the direction needs to be reversed, select the corresponding channel on the Rev Set screen and press the **R**/+ button.
6. Repeat steps 3 and 4 until you are sure all the control surfaces move in the correct direction.
7. When you're done setting direction, press **EXT** three times.

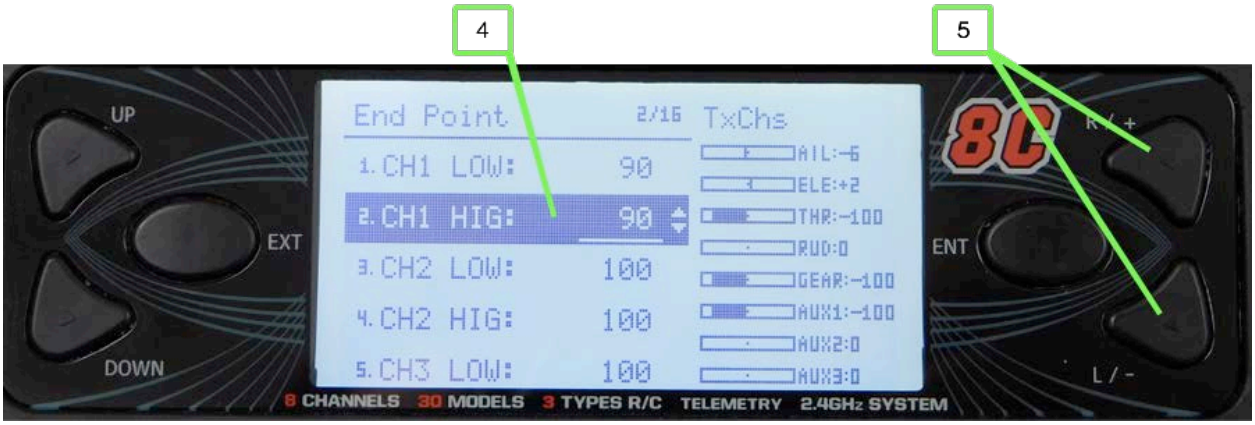
Program Servo End Points

When you set the end point for a servo, you determine the maximum amount it can move within its normal range of motion. For example, when the end point is set to 100, the servo can move though 100% of its normal range of motion. If you set the end point to 120, the servo moves through 120% of its normal range of motion.

You use end point to determine the maximum position of servos. For example, if a servo is binding when its end point is set to 100, you can reduce the end point so the servo doesn't try to move past the control surface's limitations.

1. Set the range of motion for each servo using the End Point function; from the home screen, press **ENT**, select *Model Parameter*, press **ENT**, select *End Point*, and press **ENT**. You move to the End Point screen where you see the current range for each channel indicated by the LOW and HIG settings for each channel. LOW indicates the negative side of the range while HIG indicates the positive side. Each range can be set between 0 and 120.

2. Select the channel and range of motion you want to set, such as *CH1 LOW*.
3. Press **R**/+ to increase the range in that direction (the maximum is 120) or **L**/- to decrease the range (the minimum is 0).

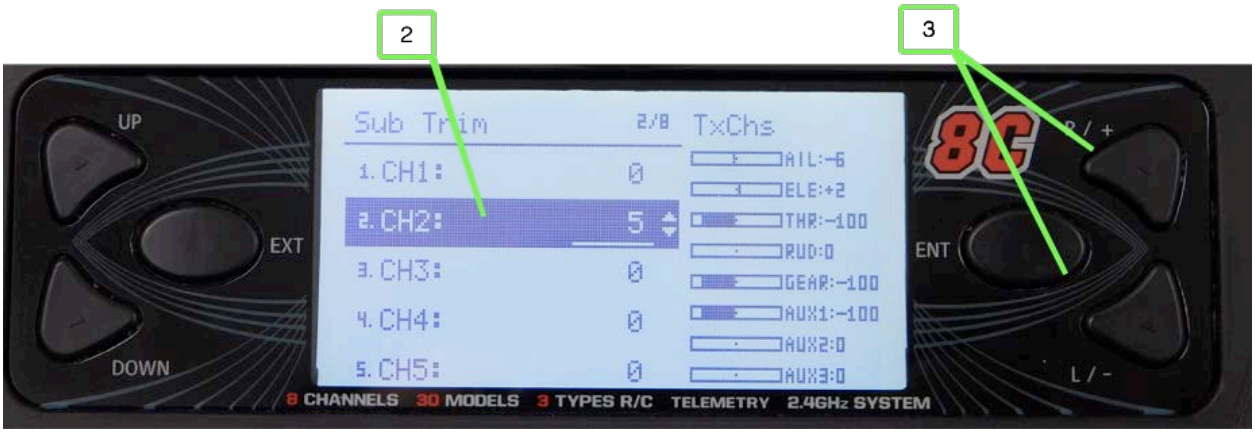


4. Select the other direction for the channel you selected in step 2, such as HIG.
5. Press **R**/+ to increase the range in that direction (the maximum is 120) or **L**/- to decrease the range (the minimum is 0).
6. Repeat steps 2-5 until you have set the range of motion for all of the channels you are using.
7. Press **EXT** three times to move back to the home screen.

Program Servo Sub Trim

Sub trim sets the position of the servo when its controlling stick is in the center position. Sub trim is often used when the servo arm isn't exactly perpendicular to the servo when it is in the neutral position to ensure there is equal movement in both directions. (Before using sub trim, you should physically set the control arm as close to perpendicular as possible by removing its screw, rotating the arm, and the securing it with its screw.)

1. From the home screen, press **ENT**, select *Model Parameter*, press **ENT**, select *Sub Trim*, and press **ENT**. You move to the Sub Trim screen where you see the current sub trim (a value between -100 and 100) for each channel.



2. Select the channel for which you want to set sub trim, such as *CH1*.
3. Press the **R/+** button to set the sub trim in the positive direction or **L/-** to set it in the negative direction until the servo arm is where you want it to be when its control is in the neutral position.
4. Repeat steps 2 and 3 until you have set the sub trim for all of the channels you are using.
5. When you're done setting sub trims, press **EXT** three times.

Program Dual Rates and Expo

The dual rates control enables you to determine how far a control surface moves for the same amount of stick movement. You can use dual rates to make control surfaces move less for the same amount of stick motion, making the control less sensitive. For example, if a plane banks too much too quickly, you can choose a lower rate to make the ailerons move less for the same amount of stick movement. You can also use dual rates to make control surfaces move further for the same motion, making the plan more responsive.

Following are a couple of situations in which you might want to use dual rates:

- You're flying a plane for the first time and aren't sure how much control surface movement you want to have. You can have the option of less control surface movement in case you find the full control movement to be too much. You can choose a lower rate to calm the plane down while you get used to it.

- You want to have multiple flight "modes." You can use the lower rate settings when you are just cruising around, during takeoff or landing, or at other times when you want the plane to be less sensitive to your control inputs. When you are doing aerobatics or just want more control, you can move into the higher rate settings.

The GAVIN-8C supports three levels of "dual rates" (the term dual rates comes from the time when radios could only support two rate settings; a more accurate name in today's world is multiple rates). You can enable or disable dual rates for the ailerons, elevators, and rudder channels individually. And, you can put the dual rates for all three channels on the same switch or use different switches for each channel. (In most cases, you want to use the same switch for all channels to keep things simpler.)

You can configure the range of motion of each control surface in each dual rate setting, which are referred to as DR0, DR1, and DR2.

Expo (short for Exponential) changes the relationship between movement of the control sticks near their center positions and the corresponding movement of control surfaces. Without expo, a control surface moves in direct proportion to a stick's motion, i.e., if you move a stick 25% of its range, the corresponding control surface also moves through 25% of its range. With expo applied, the control surface does not move in linear proportion to stick movement; expo can be positive or negative.

Positive expo means the control surface moves less with the same stick movement near its center position, e.g., if you move the stick to 25% of its range, the control surface moves less than 25% of its range. Positive expo makes a plane's controls less sensitive to stick movements near the center position, making the model less "twitchy" (meaning that it is overly sensitive). With positive expo, the plane doesn't react as quickly to stick movements near their centers, which is the area you primarily use during "normal" flight (takeoffs, landings, basic turns, etc.). As you move sticks further from their center positions, the control surfaces move exponentially more and the plane reacts more quickly to further control inputs; this is the area you use when performing aerobatics (when you want more control surface movement).

The more positive expo you apply, the larger is the range of motion of the sticks with less sensitivity.

The amount of expo you should use depends on the model you are flying and your personal preferences. You can often find suggested expo settings for a model in its manual. If not, you can use some general guidelines as a starting point: for a high-wing trainer, expo settings between 10 and 20 are usually a good starting setting while for an aerobatic plane or EDF (jet), expo settings of 30-40 are typical.

Negative expo increases the sensitivity of control surfaces to stick movement; negative expo is typically used by advanced pilots to perform extreme maneuvers. Negative expo is not recommended unless you are a very experienced pilot.

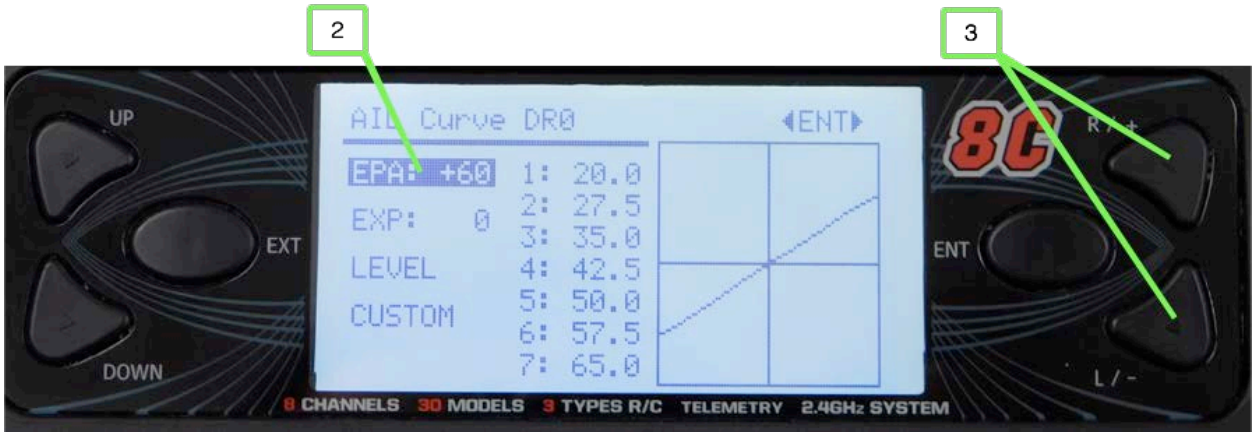
Expo is usually used in combination with dual rates. For example, when you have a higher rate selected (meaning the control surface moves more), you typically want more expo than when a

lower rate is used.

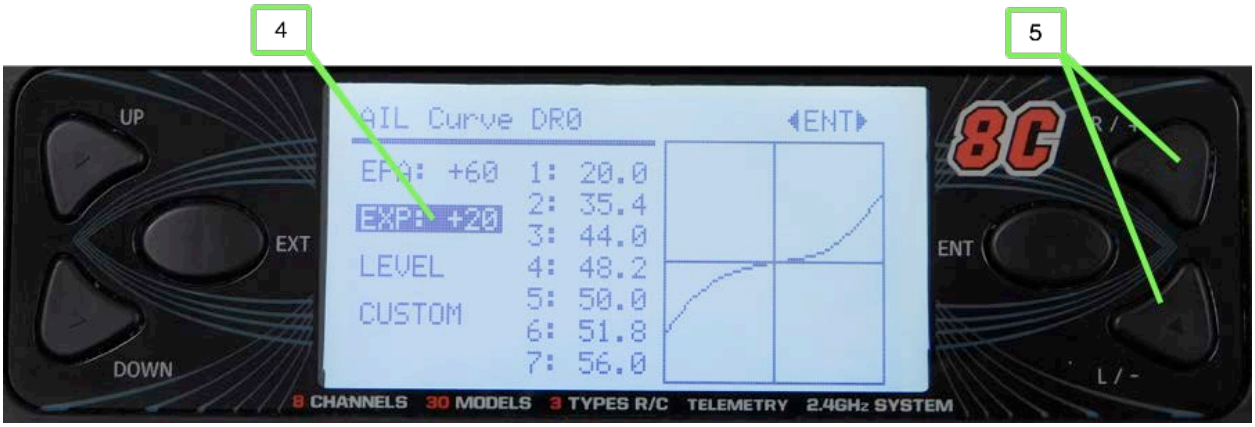
On the GAVIN-8C, you can set expo on the primary flight control surfaces (ailerons, elevator, and rudder) for each dual rate setting (DR0, DR1, and DR2). For example, on many models, you want more expo when the ailerons are on their highest rates and less when the rates are lower and you typically want more expo on the ailerons than on the rudder.

The rate and expo being used for a control are both determined by the same switch—you can configure the switch used for the rate and expo setting for each of the primary control surfaces.

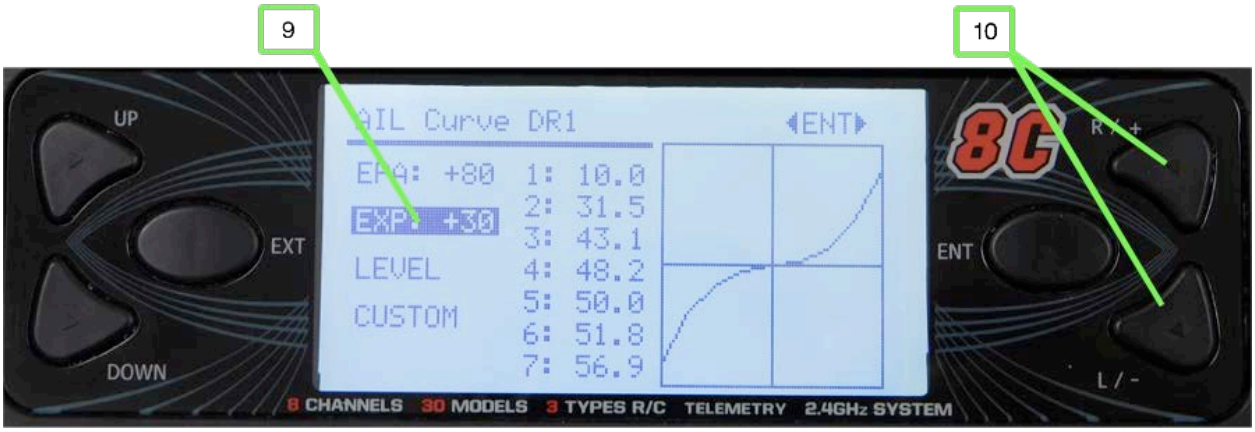
1. To configure dual rates and expo, from the home screen, press **ENT**, select *Model Parameter*, press **ENT**, select *Stick Curve*, and press **ENT**. You move to the AIL Curve DR0 screen where you set the maximum amount of aileron movement and relationship between the aileron stick movement on the transmitter and the aileron servos when the aileron rate is set to position 0.



2. Press **DOWN** to select *EPA* (End Point Adjustment).
3. Press the **R/+** button to increase the maximum amount of movement or **L/-** to decrease it. As you change the EPA setting, the graph on the right side of the screen shows the maximum position (where the curve intersects the vertical line).



4. Press **DOWN** to select *EXP*.
5. Press the **R**/+ button to increase the amount of expo or **L**/- to decrease it. As you apply expo, the graph on the right side of the screen shows the amount of expo applied. The "sharper" the curve, the more expo is applied.
6. When you are done setting rate and expo for the aileron with the rate set to the 0 position, press **ENT**. You move to the AIL Curve DR1 screen.
7. Select *EPA* (End Point Adjustment).
8. Press the **R**/+ button to increase the maximum amount of movement or **L**/- to decrease it.



9. Press **DOWN** to select *EXP*.
10. Press the **R**/+ button to increase the amount of expo or **L**/- to decrease it when the aileron rate is set to position 1.
11. Press **ENT**. You move to the AIL Curve DR2 screen.
12. Repeat steps 7 through 10 to configure the rate and expo settings when the aileron rate

switch is in position 2.

13. Press **ENT**. You move to the ELE Curve DR0 screen.
14. Repeat steps 2 through 13 to set EPA and Expo for the elevator when its rates are in the 0, 1, and 2 positions and the EPA and Expo for the rudder when its rates are in the 0, 1, and 2 positions.
15. When you are done setting rates and expo, press **EXT** two times to return to the main menu.
16. Select *Func Set* and press **ENT**.

17. To activate dual rate for the aileron, select *AIL D/R* and press the **R**/+ or **L**/- buttons until the switch you want to use to activate dual rates is shown. You can use any of the SA-SF switches to activate dual rates; choose *OFF* if you don't want to use dual rates on a channel. If you choose SF, which is a two-position switch, you toggle between positions 0 and 2 (settings for DR1 are not used). You can use a switch even if it already being used for another function. In most cases, you want the dual rate switch to be used only for dual rates.
18. To activate dual rate for the elevator, select *ELE D/R* and press the **R**/+ or **L**/- buttons until the switch you want to use to activate dual rates is shown or select *OFF* to disable it. You can use the same switch for all dual rates, which is the most common configuration.
19. Repeat step 18 to enable dual rates for the rudder channel, if desired.
20. Press **EXT** three times to return to the home screen.

21. Change the position of the D/R switch (or switches if you are using more than one switch) to change the rate and expo being used for each primary control surface. You see the current setting next to AIL, ELE, and RUD (D0, D1, or D2) on the home screen. If you hold a control stick in its maximum while you flip the D/R switch, you see the impact of the rate change on the amount of movement (the expo setting is also being used, but it is more difficult to see its impact).

Set the Switch to Control Channels

As you've seen when setting rate and expo, you can change the switch that controls channels on the receiver. For example, if a plane has retracts, you want to control them with SF because it is a two-position switch. You can use the following steps to associate a switch with a channel:

1. From the home screen, press **ENT**.
2. Select *Func Set* and press **ENT**.

3. Select the channel you want to configure, such as GEAR.

4. Press the **R/+** or **L/-** buttons until the switch you want to use to control the channel is shown.
5. Repeat steps 3 and 4 to configure the controls for other channels. For example, if flap servos are connected to the AUX1 channel, set the switch you want to use to control the flaps. (If you are using a Detrum MSR66A receiver with built-in gyro, the gyro is controlled by the switch associated with the AUX1 channel so you can't activate the control without changing the gyro setting. You need to choose the control position and gyro mode associated with each position of the switch.)

Configure a Gyro

A gyro provides automatic control over a plane to make it easier and more fun to fly. For example, a gyro can counteract the effects of turbulence on a plane by automatically applying controls to keep the plane flying smoothly. Or, you can activate the auto-recovery mode to put a plane in a straight and level orientation as a means to help you recover when you get into a tough situation.

Some receivers, such as the Detrum MSR66A, include a built-in gyro that you can configure in a number of ways:

- **Gyro off**. In this mode, the gyro is turned off and doesn't do anything.
- **Normal**. When in the Normal mode, the gyro counteracts external forces on the plane. For example, if the plane encounters a gust of wind that would normally make the plane bank, the gyro activates control surfaces to keep the plane level. This mode is useful for general flying as it limits the impact of wind and other external conditions on the plane.
- **Auto-recovery**. When this mode is active, the gyro returns the plane to a straight and level attitude. It is most useful for recovering the plane when you lose orientation or get into a position that you aren't able to recover from. Activating this mode returns the plane to level flight, potentially preventing a crash.
- **Aerobatic**. In this mode, the gyro attempts to hold the plane in its current orientation. This is especially useful when you are performing aerobatics, because once you put the plane in the desired orientation, the gyro attempts to hold it in that position. For example, if you perform a knife edge, the gyro attempts to keep the plane in that orientation.
- **Gain**. The gain is the strength of the control the gyro provides to the channels it is controlling. The larger the gain, the more control the gyro applies. If the gain is set too high, a control surface can oscillate, which can cause the plane to fly erratically and potentially crash. If the gain isn't set large enough, the gyro won't have enough control.

The only way to know how much gain you need is by flying the plane and making adjustments based on how it flies with the gyro active. Start with the gains set to their default levels. If you observe oscillation, such as in pitch, you should decrease the pitch gain. If the gyro seems to be having little to no effect, you can increase the pitch gain. Changes to gains should be made in very small increments and always based on flight performance.

- **Mounting**. The gyro needs to be correctly oriented with the plane to perform correctly. This setting identifies how the receiver is mounted in the plane.

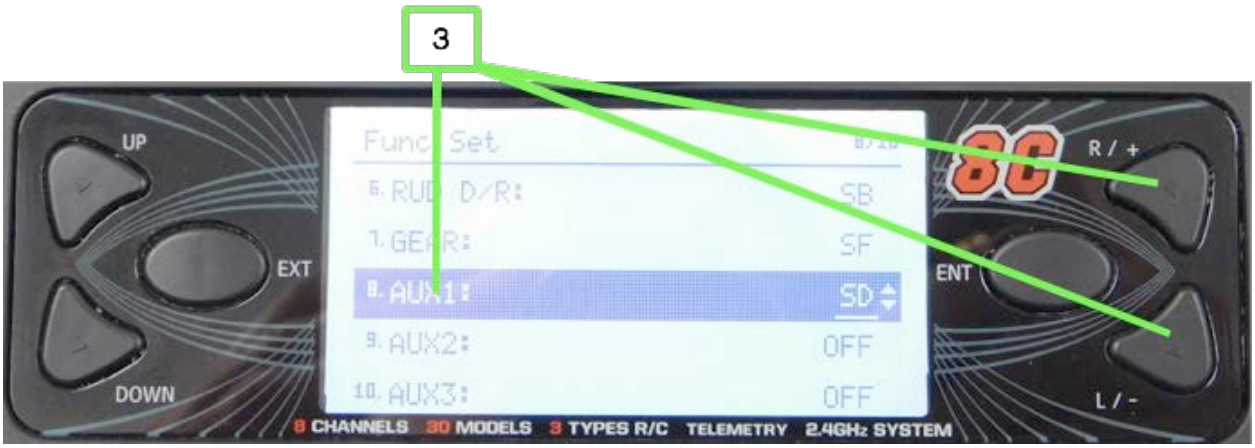
- **Wing Type**. This setting enables the gyro to control various configurations, such as standard ailerons, delta wing, or v-tail.

- **Offsets**. The offset is used to counteract differences between the receiver's mounting position relative to the plane's roll and pitch axes when the Auto-recovery mode is used (the receiver should be aligned with the plane's axes as much as possible). For example, if the gyro isn't exactly at 0 degrees bank when the plane is perfectly level and the Auto-recovery mode is made active, the plane matches the bank angle of the receiver rather than the plane. You can adjust the roll offset so that when the Auto-recovery mode is active, the plane has zero bank and is perfectly level. You can also adjust the offset for the pitch axis. Like the gains, you should leave the offsets in their default settings and adjust them based on flight performance. Changes to the offsets should also be done in small increments.

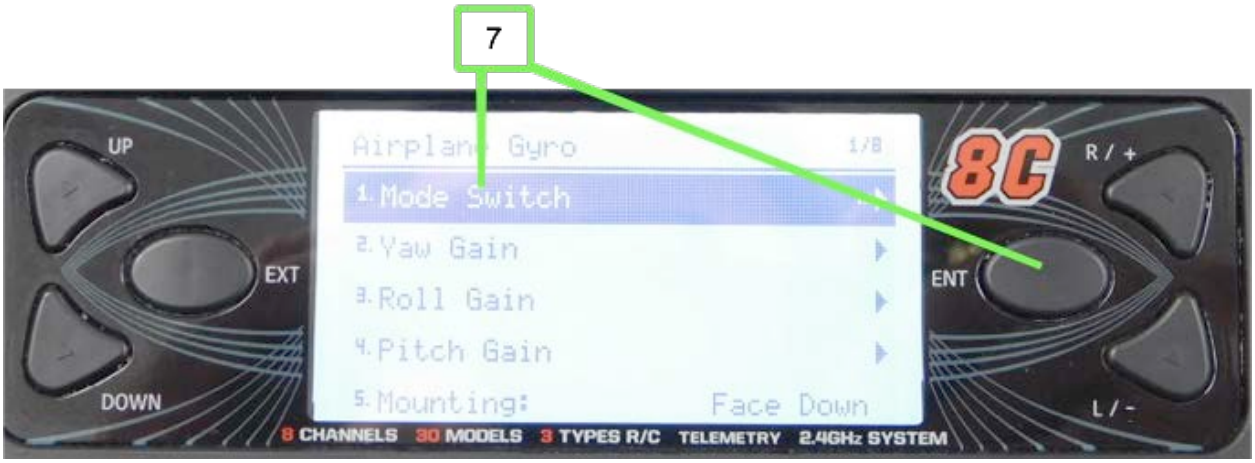
On the Detrum MSR66A, the AUX1 port is tied to the gyro. You can't use this port to control something on the plane, such as flaps, and the gyro modes independently. If you want to use flaps, you'll need to associate a specific gyro mode with each position of the flap switch and the flap position and gyro mode will always go to together. For example, you might want the gyro to be in Auto-recovery mode when flaps are fully deployed, but in Normal mode when the flaps are in the other positions. You can also set the gyro to be in the same mode, such as Normal, regardless of switch position so that it will be active all the time while the flaps are set according to the switch's position.

You can configure a receiver with the Detrum MSR66A gyro directly with the GAVIN-8C transmitter as follows (different models of receivers may have slightly different steps):

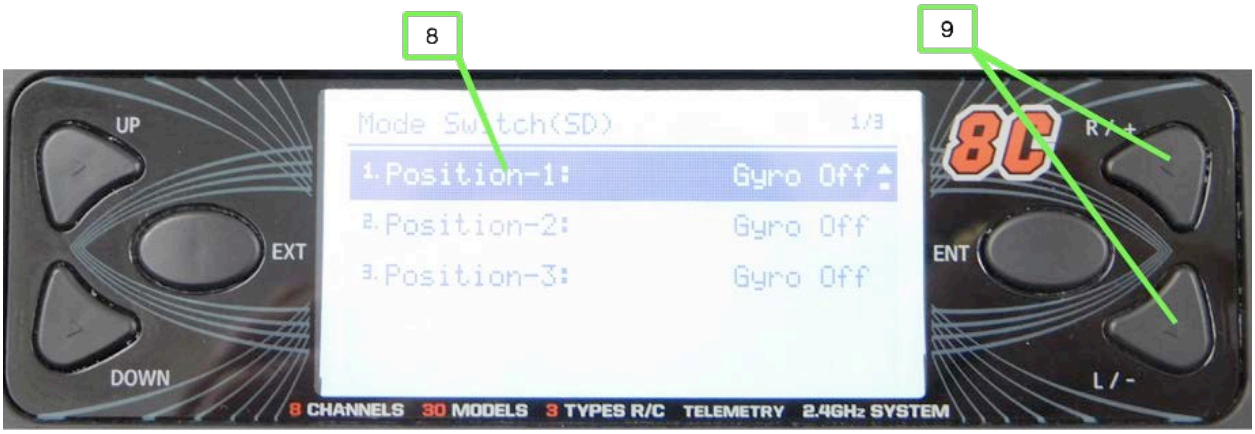
1. From the home screen, press **ENT**.
2. Select *Func Set* and press **ENT**.



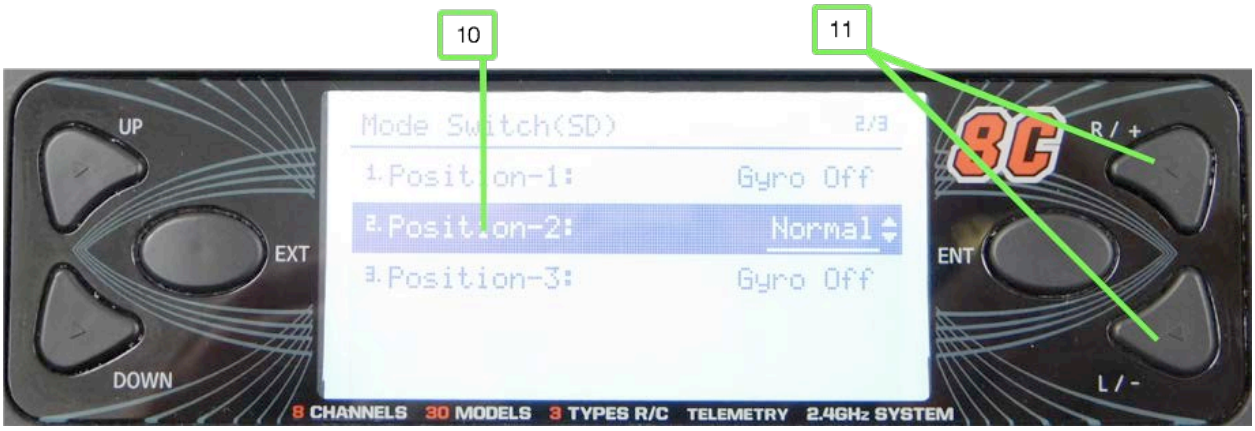
3. Select AUX1 (this may be different with other receiver models) and use the **R**/+ or **L**/- buttons to associate the AUX1 channel with a switch, such as SD.
4. Press **EXT**.
5. Select *Model Parameter* and press **ENT**.
6. Select *Airplane Gyro* and press **ENT**.



7. Select *Mode Switch* and press **ENT**.



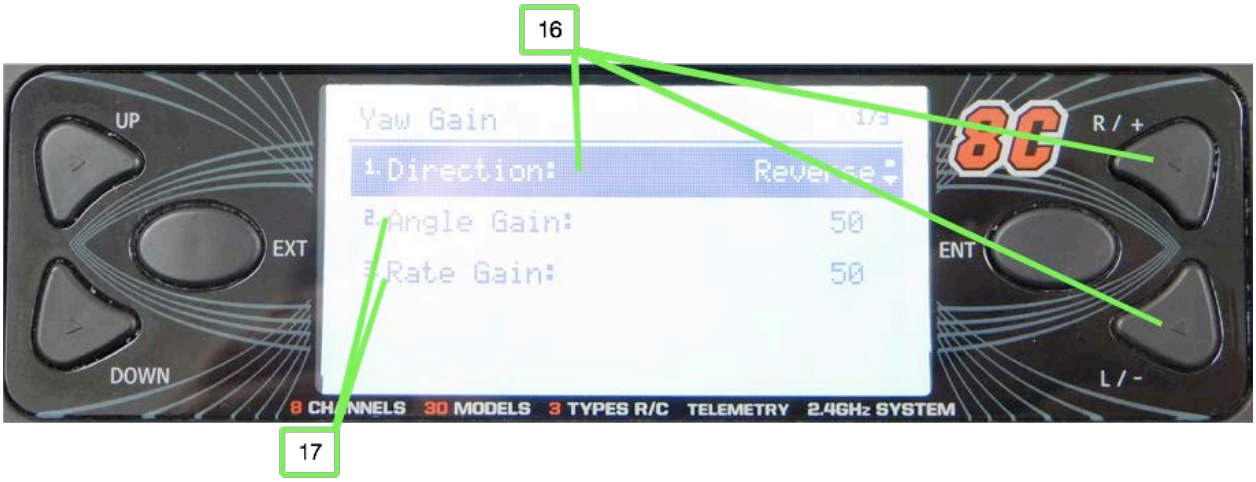
8. Move the switch associated with the gyro to position 1, which is then highlighted on the screen.
9. Use the **R**/+ or **L**/- buttons to select the gyro mode when the associated switch is in the first position. For example, to disable the gyro when the switch is in this position, choose Gyro Off.



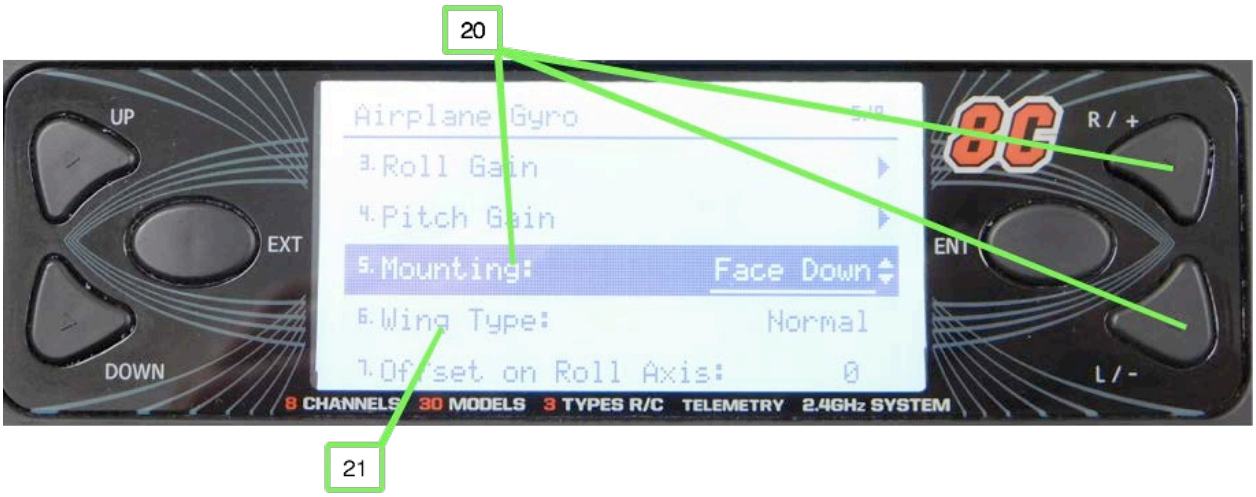
10. Move the switch associated with the gyro to position 2, which is then highlighted on the screen.
11. Use the **R**/+ or **L**/- buttons to select the gyro mode when the associated switch is in the second position. For example, to put the gyro in Normal mode, choose Normal.
12. Move the switch associated with the gyro to position 3, which is then highlighted on the screen.
13. Use the **R**/+ or **L**/- buttons to select the gyro mode when the associated switch is in the third position. For example, to return the plane to level flight when you move the switch to position 3, choose Auto-recovery.

*While you are making changes to the gyro settings, the transmitter may start beeping. This indicates you need to save the changes by pressing **ENT**. You can do this after you've configured all of the gyro settings.*

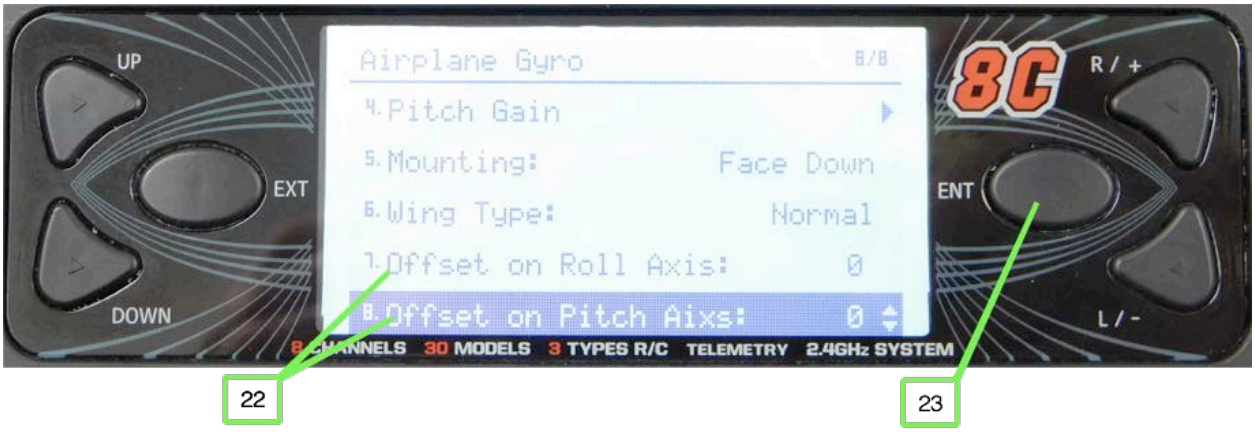
14. Press **EXT**.
15. Select *Yaw Gain* and press **ENT**.



16. If you need to reverser the gyro's movement of the rudder, select Direction and press the **R**/+ or **L**/- button. You can tell this with the plane fully set up and the gyro in normal mode. Rapidly rotate the plane's nose to the right, the gyro should automatically move the rudder to the left to try to return the plane to neutral yaw. If the rudder moves to the right instead, increasing the yaw of the plane, the gyro direction needs to be reversed.
17. If you need to adjust the gains, select the gain you want to adjust (Angle or Rate) and use the **R**/+ or **L**/- buttons to increase or decrease the gain. You should fly the plane with the default values and adjust the gains only if needed. These are fairly advanced settings and you probably won't need to change them.
18. Press **EXT**.
19. Repeat steps 15 through 18 to set the direction and gains for the roll and pitch axes. Make sure you check the direction of the gyro's action for each so the gyro's input opposes the way you move the plane. For example, if you bank the plane to the right, the gyro should apply up left aileron and down right aileron to counteract your movement.



20. Select *Mounting* and use the **R**/+ or **L**/- buttons to select the orientation of the receiver in the plane, such as Face Up.
21. Select Wing Type and use the **R**/+ or **L**/- buttons to select the plane's configuration, such as Normal if the plane has a standard configuration (ailerons, elevators, and rudder).



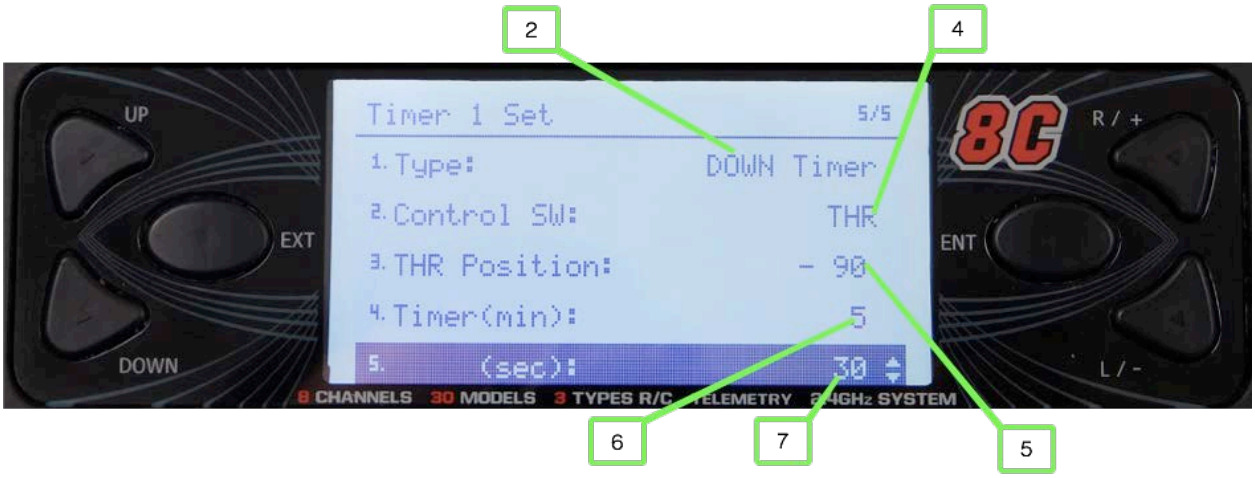
22. Use the Offset on Roll Axis and Offset on Pitch Axis selections to change the amount of offset used for the roll and pitch axes. You only need to adjust these if the plane doesn't return to straight and level orientation when the Auto-recovery mode is activated. For example, if you activate Auto-recovery and the plane banks to the right, you need to adjust the roll offset in the opposite direction. The closer aligned to the plane's axes that the receiver is mounted, the less offset you need.
23. When you're done configuring the gyro, press **ENT**. The transmitter resets the receiver and restarts both the transmitter and receiver. The gyro uses the configuration you set.

Set Timers

It's a good idea to set timers so you know when you should land a model—before it runs the LiPo flight pack battery down so far that the ESC shuts down or damages the battery. Typically, you want the timer to start when you advance the throttle and stop when the throttle is off.

You can often find the suggested flight time for a specific battery capacity in the manual provided with a model. If not, it can take some experimentation to determine the time you should set for your model and the batteries you use. Start with a conservative value and test the battery status when you are done with a flight. You can then increase or decrease the timer accordingly.

1. Set the timers using the Timer Set screens; from the home screen, press **ENT**, select *Model Set*, press **ENT**, select *Timer 1 Set*, and press **ENT**.

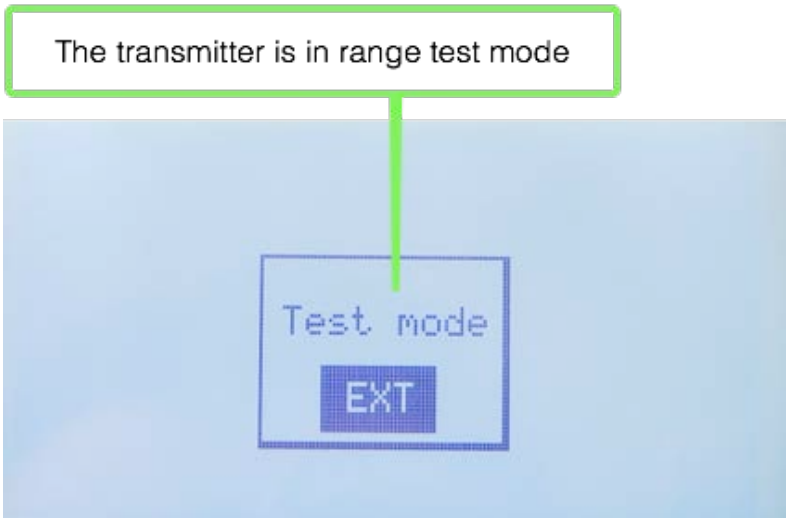


2. Select Type and use the **R**/+ or **L**/- buttons to choose a setting for timer 1. *OFF* leaves the timer inactive. *UP Timer* causes the timer to count up. *DOWN Timer* causes the timer to count down starting from a time you set.
3. If you selected OFF in step 2, skip to step 8.
4. Select *Control SW* and use the **R**/+ or **L**/- buttons to choose the control you want to associate with the timer. The most common control is the *THR* (throttle) so that the timer measures the amount of time the throttle is applied. You can also choose to operate the timer with the SA or SD switch.
5. If you selected *THR* in step 4, select *THR Position* and use the **R**/+ or **L**/- buttons to set the throttle position at which the timer starts; if you didn't select THR, skip this step. The default is -90, which starts the timer as soon as the throttle moves above the -90 position.
6. Select *Timer (min)* and use the **R**/+ or **L**/- buttons to set the minutes of time associated with the timer.

7. Select *(sec)* and use the **R/+** or **L/-** buttons to set the seconds of time associated with the timer. For example, to have the timer start counting down from 5 minutes and 30 seconds, choose 5 in step 6 and 30 in step 7.
8. Press **EXT** to move back to the Model Set screen.
9. Select *Timer 2 Set*, and press **ENT**. You move to the Timer 2 Set screen.
10. Use steps 2-7 to configure timer 2. If you want to use only timer 1, set timer 2 to *OFF*.
11. When you're done setting timer 2, press **EXT** three times to move back to the home screen. You see the timers, which are labeled 1 and 2 on the screen. The timers activate according to your settings; for example, a timer associated with the throttle position runs when the throttle is above the position set in step 5.

Perform a Range Test

1. You should perform a range test for any new model; to start the test, hold the **ENT** button down and turn the transmitter on.



2. Connect the receiver to the battery and it binds to the transmitter. You see "Test mode" on the transmitter screen and its status light flashes.
3. Walk 30-50 feet from the model while activating controls to make sure the control surfaces move when you move the associated transmitter controls.
4. If you can get at least 30 feet away from the model and still have control, it passes the range test and is ready to fly. If not, you need to re-position the receiver or antennas and repeat the range test until it passes.
5. Press **EXT** to exit the range test mode.